Addendum to the Big Otter River Basin Fecal Coliform TMDLs (January 2001)

EPA's comments, as provided in their letter reviewing the fecal coliform TMDLs for five impaired segments in the Big Otter River basin, are re-stated in italics and followed by the particular response for each comment.

EPA: *Section 5.2.1, States that there are two point sources (Gunnoe Sausage Company and Otter River Elementary School) in the Elk Creek watershed. However, section 5.3.2 states that there is only one permitted point source. It is mentioned that neither of these facilities discharge to the impaired segment of Elk Creek. How many point sources are there within the Elk Creek watershed? How was their load allocated to the Big Otter? For the allocation were the point sources modeled as discharging at their permitted concentration?*

Response: There are two point sources for fecal coliform in the Elk Creek watershed: Gunnoe Sausage Company (VA0001449) and Otter River Elementary School (VA0020851). Neither of these contributed fecal coliform to the impaired segment on Elk Creek. Only the Gunnoe Sausage Company (VA0001449) was used in the simulations as a contributor to the impairment of the Lower Big Otter River. The Otter River Elementary School (VA0020851) was not used in the simulations for the Lower Big Otter River impairment because the design flow for this source was 0.0696 cfs, which was considered insignificant. The Gunnoe Sausage Company point source (VA0001449) was modeled as discharging fecal coliform at the permitted concentration for the allocation. Table 1 summarizes the flow and load information for Elk Creek. The point source load from Elk Creek was incorporated into the Lower Big Otter TMDL simulations as an upstream inflow. As modeled, the outflow from Elk Creek flows into Buffalo Creek, and the Buffalo Creek outflow is an inflow into the Lower Big Otter River.

Table 1. The hourly and annual loads from the point sources in the Elk Creek watershed.

PS Discharge	Flow (cfs)	Load (cfu/hr)	Annual Load[1] (cfu/yr)
VA0001449 [2]	0.6003	122,500,000	1.07×10^{12}
VA0020851 [2]	0.0696	14,200,000	1.24×10^{11}
Total			**1.19×10^{12}**

[1] Annual load is hourly load times 8,760 hr/yr

[2] Does not contribute to impaired segment in Elk Creek HUP.

EPA: *Section 7.2.1, States that there are four permitted point sources in the Little Otter River watershed. However, in Section 7.3.2 it mentions that there are five permitted point sources, two of which were modeled for. Please verify the number of permitted point sources within this watershed. Was the Waste Load Allocation (WLA) set at a value that incorporates the permitted discharge of all of the permitted point sources? How was the loading from the facilities not modeled incorporated into the WLA and how was it determined that this additional loading would not affect the model? A WLA for each point source should be provided as an addendum to the report. A modeling run showing the effects of the non-modeled point sources should be provided with the addendum.*

Response: Section 7.3.2 is in error and should state there are four permitted point sources in the Little Otter River watershed. Section 7.2.1 is correct in regards to the number of permitted point sources in the Little Otter River watershed. However, only three of these point sources have limits for fecal coliform or the alternate disinfection clause in their permit and thus need WLAs for fecal coliform. Table 2 shows the point sources listed in table 7.5 of the TMDL document and the modified list for this addendum.

Table 2. List of permitted point sources in the Little Otter River watershed (L26b)

Name of Point Source		VPDES Permit No.	Comment
TMDL report:			
Thaxton Elementary School	Table 7.5	VA0020869	Listed but not modeled
Liberty High School	Table 7.5	VA0020796	Listed but not modeled
Dillons Trailer Park	Table 7.5	VA0087840	Listed but not modeled
City of Bedford STP	Table 7.5	VA0022390	Listed and modeled
City of Bedford WTP	Addendum	VA0001503	Modeled but not listed
Addendum:			
Thaxton Elementary School		VA0020869	Not included (no discharge to L26b)
Liberty High School		VA0020796	Included
Dillons Trailer Park		VA0087840	Included
City of Bedford STP		VA0022390	Included
City of Bedford WTP		VA0001503	Not included (no permit limit)

A comparison of annual loads using only those point sources given a WLA in the TMDL and using all point sources with a fecal coliform permit component is shown in table 3. While VA0001503 was given a WLA in the TMDL, that facility's permit is for flow, pH and TSS only, making a fecal coliform WLA unnecessary. The WLAs were calculated and modeled as if all the point sources were discharging fecal coliform at the permitted concentrations. As table 3 illustrates, there is no difference in the sum of wasteload allocations between the original point source simulation used in the TMDL and the simulation using all point sources with a fecal coliform permit component.

Table 3. The hourly and annual loads from the point sources in the Little Otter River watershed.

PS Discharge TMDL	**Flow (cfs)**	**Load (cfu/hr)**	**Annual Load[1] (cfu/yr)**
VA0001503	0.0680	13,900,000	1.22×10^{11}
VA0022390	3.0950	631,000,000	5.53×10^{12}
Total			**5.65×10^{12}**
PS Discharge Addendum			
VA0001503	0.0680	N/A[2]	N/A
VA0022390	3.0950	631,000,000	5.53×10^{12}
VA0020796	0.0378	7,800,000	6.83×10^{10}
VA0087840	0.0279	5,700,000	4.99×10^{10}
Total			**5.65×10^{12}**

[1] Annual load is hourly load times 8,760 hr/yr

[2] Permit is for flow, pH and TSS only (filter backwash at WTP)

Supporting this assessment is a modeling run using 200 cfu/100mL at design flow for all five point sources originally considered in the TMDL. Figure 1 shows a plot of the difference between the two modeling runs, indicating that the difference in terms of concentrations never exceeds 0.9 counts/100 mL. This increase did not result in any violations of the 30-day geometric mean standard with a 5% margin of safety, i.e. 190 cfu/100mL. Therefore, the Little Otter River TMDL accurately represents the point sources along this segment.

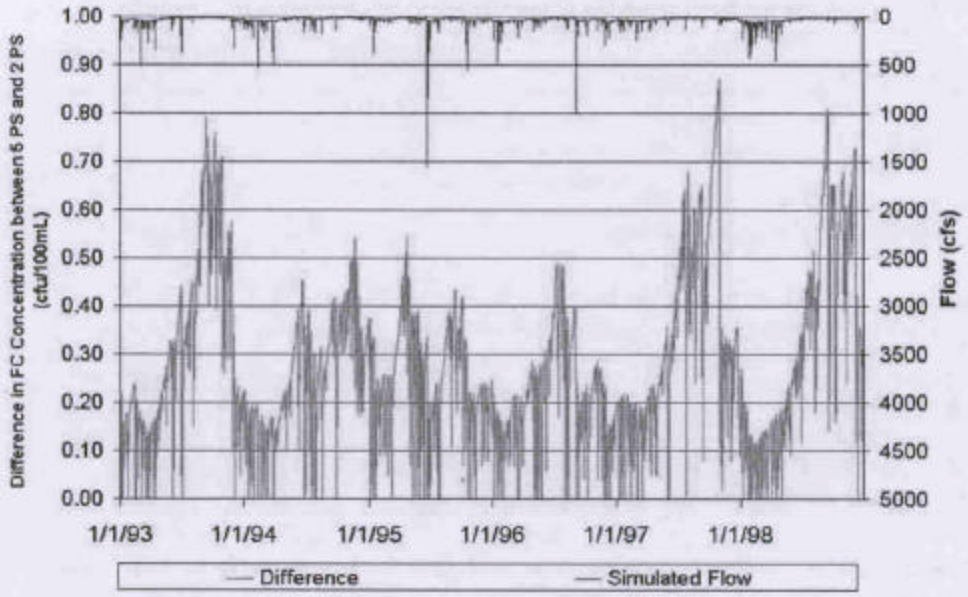

Figure 1. Difference in fecal coliform concentration for the modeling run with five point sources and the modeling run with only the original two point sources used in the simulations.

To reflect the above analysis, tables 1.17 and 7.22 need to be replaced with the following table 4. The WLA should read 5.65×10^{12} and not 6.8×10^{12}. It appears that in adding the original point source loads, the exponent for VA0001503 was misread as 12 instead of 11.

Table 4. Annual fecal coliform loadings (cfu/year) used for developing the fecal coliform TMDL for the Little Otter River watershed (L26b)

Subwatershed	ΣWLA	ΣLA[a]	MOS[b]	TMDL
Little Otter River	5.65×10^{12}	$1{,}377.7 \times 10^{12}$	72.8×10^{12}	$1{,}456.15 \times 10^{12}$

[a] with LA from Machine Creek inflow of 849.4×10^{12} cfu/year

[b] Five percent of TMDL

Tables 5-8 show summaries of flow and loading information for permitted dischargers along the Machine Creek, Buffalo Creek, Flat Creek and the Lower Big Otter River impaired segments.

Table 5. The hourly and annual loads from the point sources in the Machine Creek watershed.

PS Discharge	Flow (cfs)	Load (cfu/hr)	Annual Load[1] (cfu/yr)
VA0020818	0.0696	14,200,000	$1.24x10^{11}$
Total			**$1.24x10^{11}$**

[1] Annual load is hourly load times 8,760 hr/yr

Table 6. The hourly and annual loads from the point sources in the Buffalo Creek watershed.

PS Discharge	Flow (cfs)	Load (cfu/hr)	Annual Load[1] (cfu/yr)
VA0020826	0.0062	1,270,000	$1.11x10^{10}$
VA0078999	0.6173	126,000,000	$1.10x10^{12}$
VA0089311	0.0124	N/A[2]	N/A
Total			**$1.11x10^{12}$**

[1] Annual load is hourly load times 8,760 hr/yr
[2] Permitted to discharge pool water (pH, solids).

Table 7. The hourly and annual loads from the point sources in the Flat Creek watershed.

PS Discharge	Flow (cfs)	Load (cfu/hr)	Annual Load[1] (cfu/yr)
VA0031194	0.3713	75,800,000	$6.64x10^{11}$
VA0050628	3.2492	N/A[2]	N/A
Total			**$6.64x10^{11}$**

[1] Annual load is hourly load times 8,760 hr/yr
[2] Permitted to discharge quarry dewatering (pH, solids) only.

Table 8. The hourly and annual loads from the point sources in the Lower Big Otter watershed.

PS Discharge	Flow (cfs)	Load (cfu/hr)	Annual Load (cfu/yr)
VA0078646	0.04641	N/A[1]	N/A
Total			**N/A**

[1] Permit is for flow, pH and TSS only (filter backwash at WTP)

All waste load allocations (WLAs) were calculated based on each point source discharging fecal coliform at permitted limits. Future changes in the permit may require a re-examination of the TMDLs to see if there are any impacts on water quality.